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ADVISORY COMMITTEE ON
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AM PM

TO: Mr. David Ward, ACRS
FROM: Anthony Debons, Ph.D., Consultant *[Signature]*
DATE: September 22, 1982
SUBJECT: September 7, 1982 Meeting of Subcommittee
ACRS

1. In the generation of these comments I have reviewed the following documents in addition to the notes I accumulated as the results of the briefings presented.

Nuclear Regulatory Commission Integrated
Human Factors Program Plan for FY83-85.

Memorandum, J. Preston, ACRS, same subject,
dated September 7, 1982.

2. The intention of the document "NRC Integrated Human Factors Program Plan for FY83-85" was clearly stated in the introduction.

"this program plan describes the present NRC human factors activities, identifies the issues that need to be resolved, but were not addressed in NUREG-0660, and describes the activities which will be conducted to provide the bases for the resolution of the issues discussed".

Inasmuch as I have been asked to assess whether or not this document, as it presently stands, is adequate for the presentation to the commission, this judgment should direct itself to two separate issues:

Have the stated objectives of the document been met?

Does the program plan provide a cohesive statement of research effort intended - to a degree of specificity through which a clear understanding can be achieved as to what research is required, who is doing it or going to do it, when and how?

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5. Considerable data can be obtained from simulations to support revised training concepts. The data can be applied in generating new examinations and testing procedures. Its important, however, to insure that individuals who undergo simulation experiences are not exposed to scenarios, the understanding of which would influence their performance on the simulations.

6. In brief,

- I do not find the present document to be sufficiently objectionable to preclude its submission to the commission as a source of information. It is not an adequate document for NRC management to make judgment on resource allocation for priority research matters.
- There should be marshaling of research attention to the cognitive area with corresponding research resource allocation.
- There should be an increase awareness and use of data gathered from plant simulations to serve research on system modification and training requirement.

The two issues, of course, are not mutually exclusive.

I concur with the comments from the Preston memorandum reflecting Kirby's judgments about the plan. I am inclined to be less critical, however, if I accept the fact that the intention of the document is to present a description of the issues. Barring editorial refinements, the document does an adequate job of presenting current concerns.

The document, however, fails in presenting a comprehensive statement as to what research is required in each of the areas. Section IV, Long Range Research, is seriously deficient in a number of areas:

- Identifying in simple language problems that require resolution.
 - Translating problem statements to hypothesis - thereby identifying critical variables.
 - The priority of the problem in relation to other problems.
 - Resources required to undertake research.
 - Agency or agencies to conduct the research.
3. One of the critical matters that surfaced during the meeting concerned the present knowledge on human reliability data, particularly as it pertains to probabilistic risk assessment. My judgment leads me to stress the importance of this issue and the need for research that will direct itself to specific problems in human reliability (e.g. command-control-communication).
4. I need to express my concern for the apparent lack of priority given to the cognitive performance aspects of probabilistic risk assessment. This should be given considerable attention in the research program that is developed. I stress the importance of realizing the nature of the information system that governs the operation of the plant before adequate considerations can be given to the human factors aspects. This requires a careful mapping of the data flows among each element of the environment, how the flow serves the various components, the translation of such data flows to information (cognitive) requirements. Based on such understanding, we can then apply our knowledge of human factors to determine whether our information system can serve as an adequate augmentor of human intellectual functions. The adequate exercise and application of human intellectual functions will be central in plant management operations - in crisis situations. Equipments (computers, displays and other technological paraphernalia) only serve as aids to such functions. The program plan does not adequately account for this concept.